

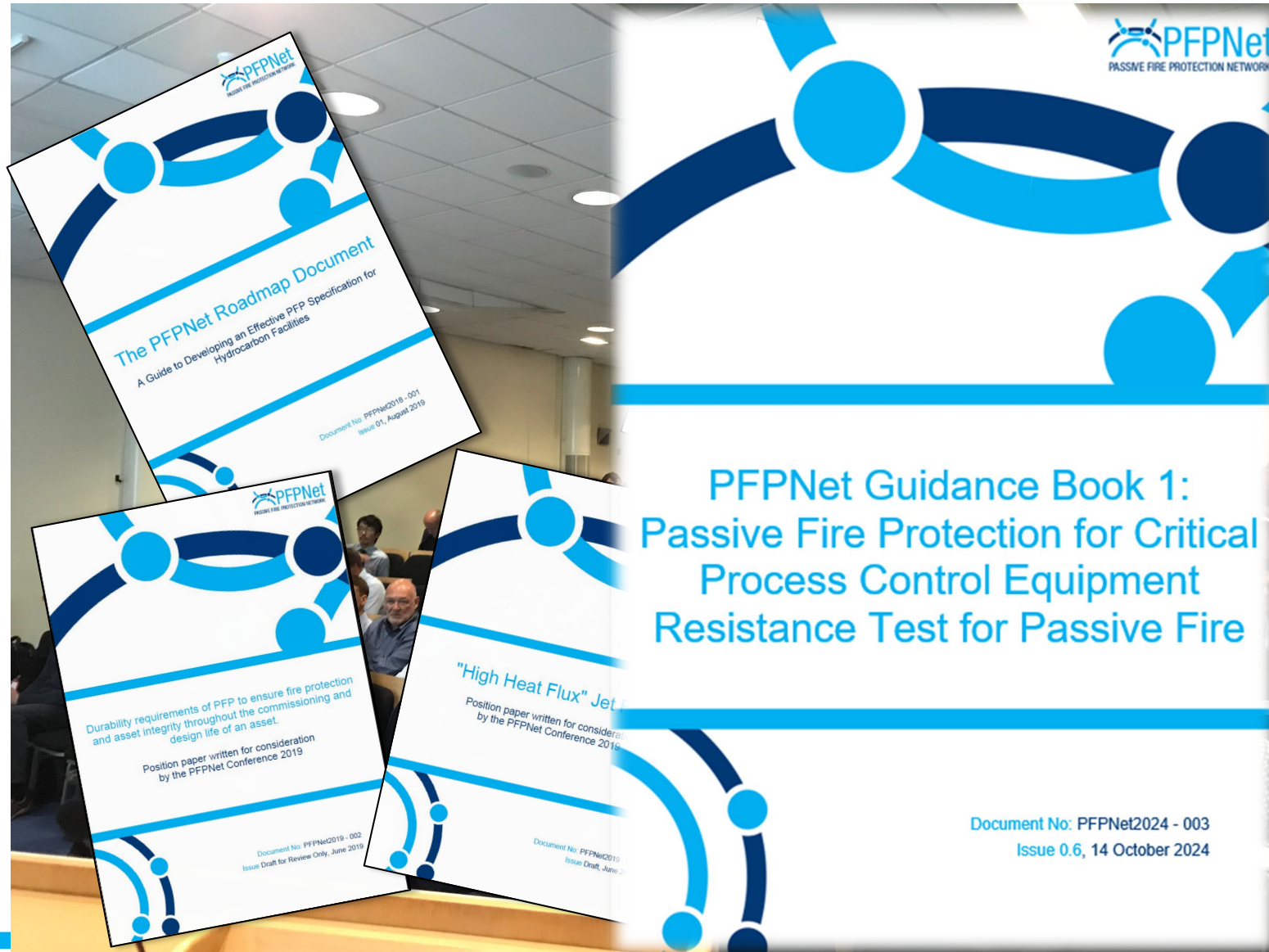
Design Guide Book 1: PFP for CPCE PFPNet project report

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PFPNet Publications

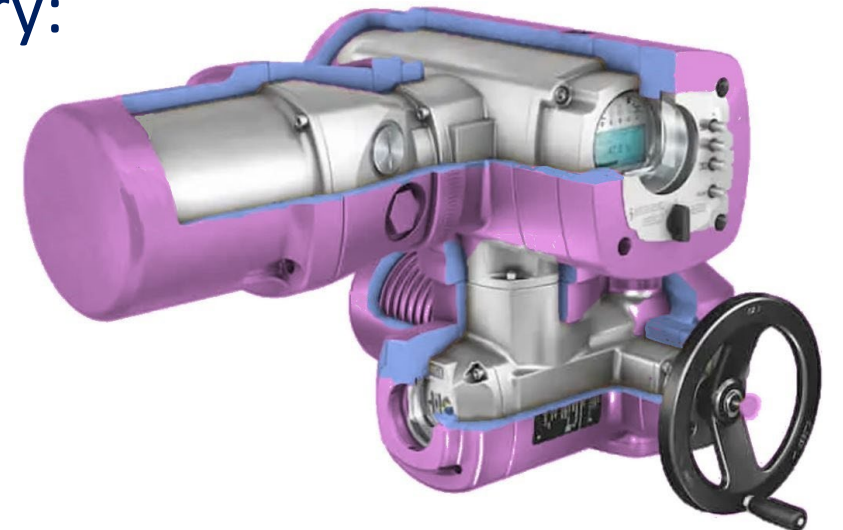


The latest edition to the suite of PFPNet guidance documents



Why start with PFP for CPCE?

- **Critical** process control equipment – vital to safety
- Yet this area of PFP has been described as the ‘wild west’
- One of the areas with, currently, the least guidance and standards available
- Clear desire for guidance from across the industry:
 - Owners
 - Assessment and verification bodies
 - Test labs
 - Manufacturers





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Design Guides



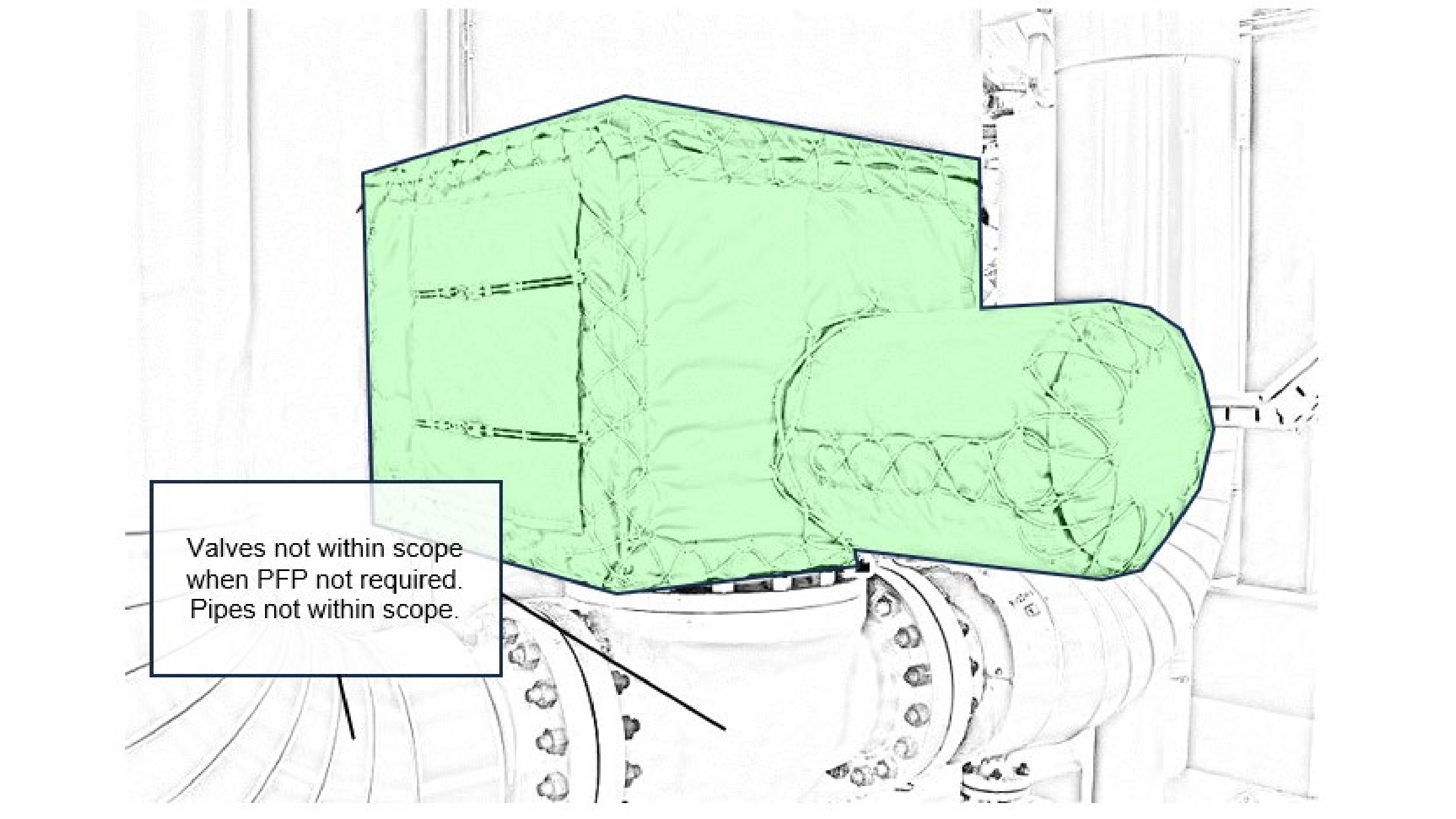
- CPCE is the first subject of PFPNet guidance book
- The contents will set a precedent for future books
- Key contents
 - Reminder of obligations on all involved with PFP
 - Considerations in the design/selection of PFP
 - Testing - which standards are applicable and what to test
 - Assessment - what to do with the data and the applicability
 - Certification - minimum contents and limitations
 - Key considerations for specification (detailing considerations)



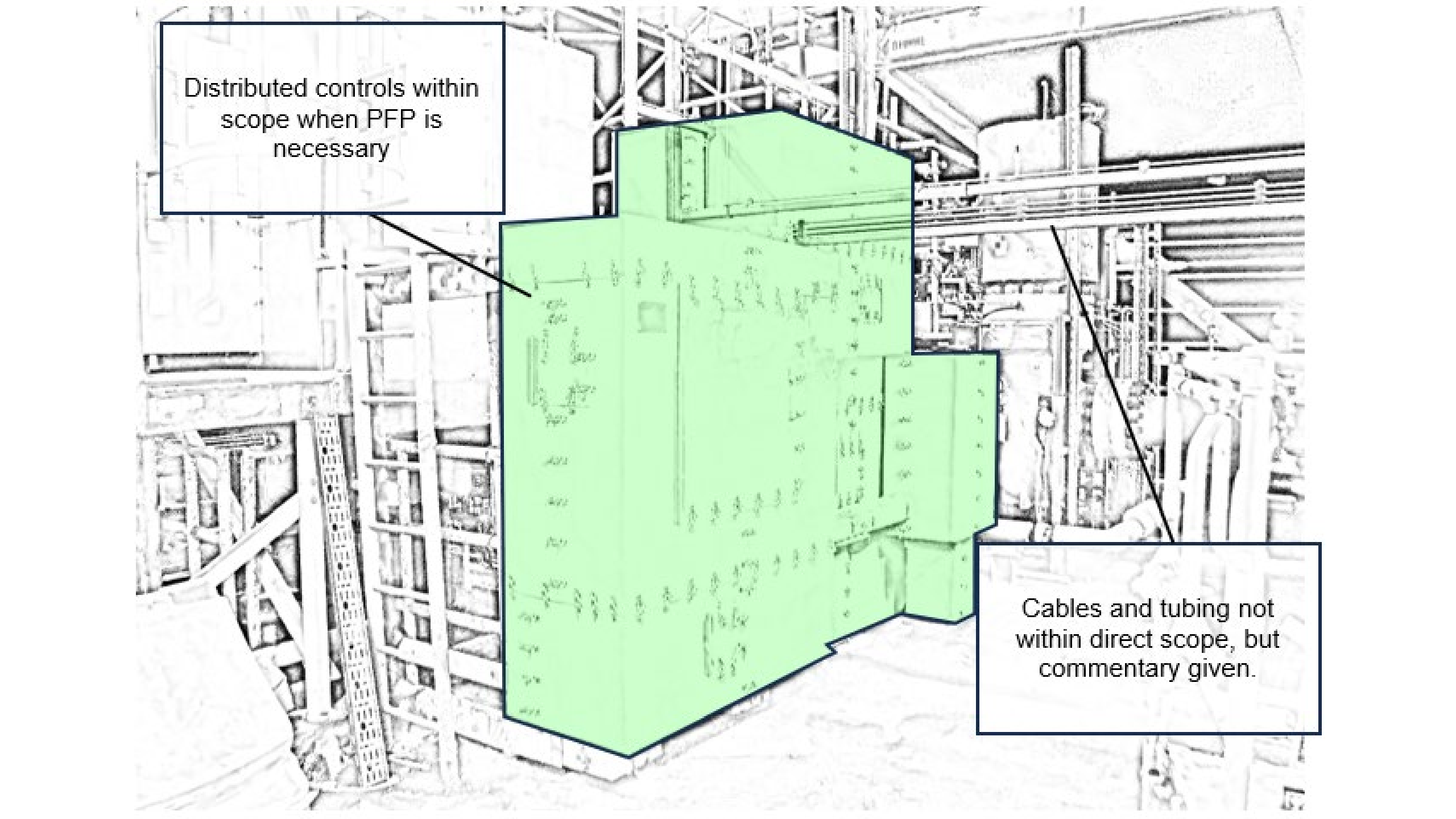
Scope



Actuators within scope.
Valves within scope when
PFP identified as
necessary.

A technical drawing of a mechanical assembly, possibly a turbine or engine component. A large section of the assembly is highlighted in green, indicating a specific area of interest or a specific material. The highlighted area includes a large rectangular block and a curved, cylindrical component. The drawing shows various mechanical details, including bolts, flanges, and internal structures. A text box with a black border is positioned on the left side of the drawing, containing text that explains the scope of the highlighted area.

Valves not within scope
when PFP not required.
Pipes not within scope.

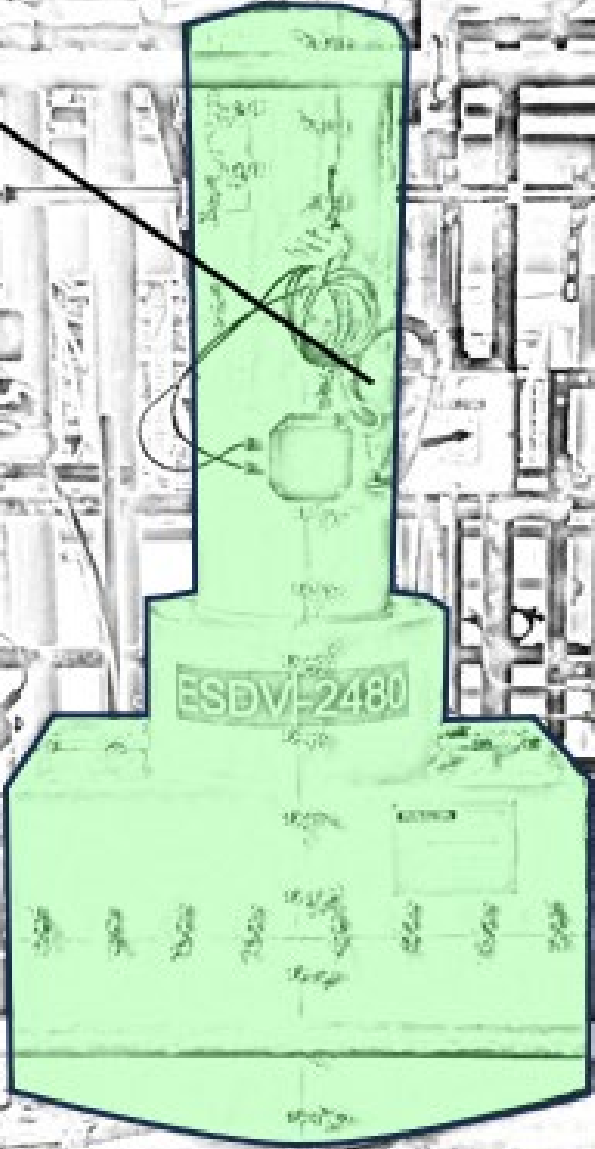


Distributed controls within scope when PFP is necessary

Cables and tubing not within direct scope, but commentary given.

Local controls within scope if PFP required.

Distributed control systems not within scope if no PFP required.





Considerations for in the design / selection

Considerations



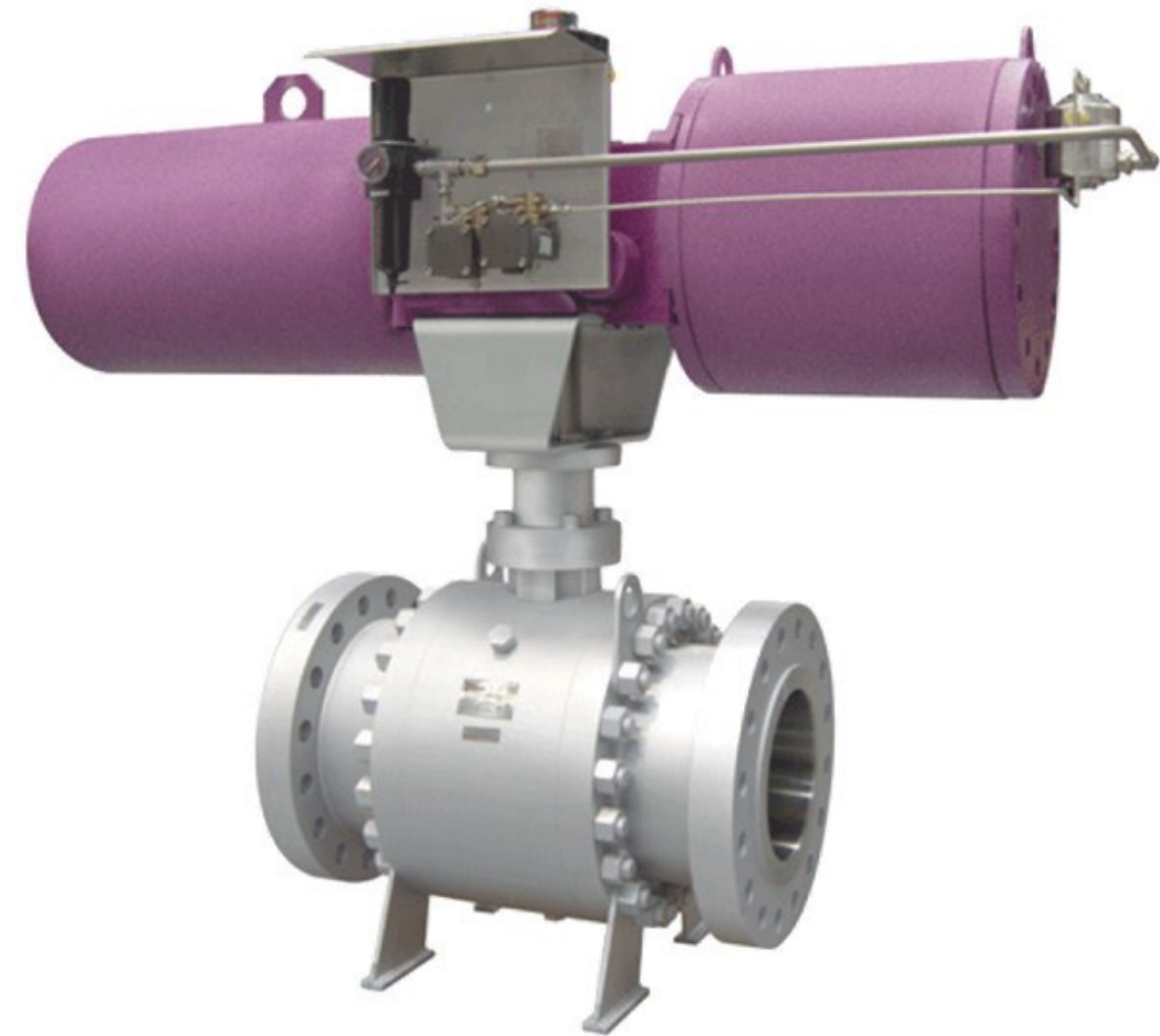
- Explosion prevention (ATEX/API (RP) 500/505)
- Explosion survivability
- CPCE operability
- Compatibility
- Access
- Sealing (watertightness or drainage)
- Process/operating temperatures

Testing & assessment



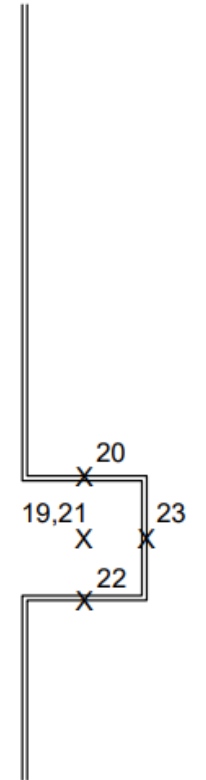
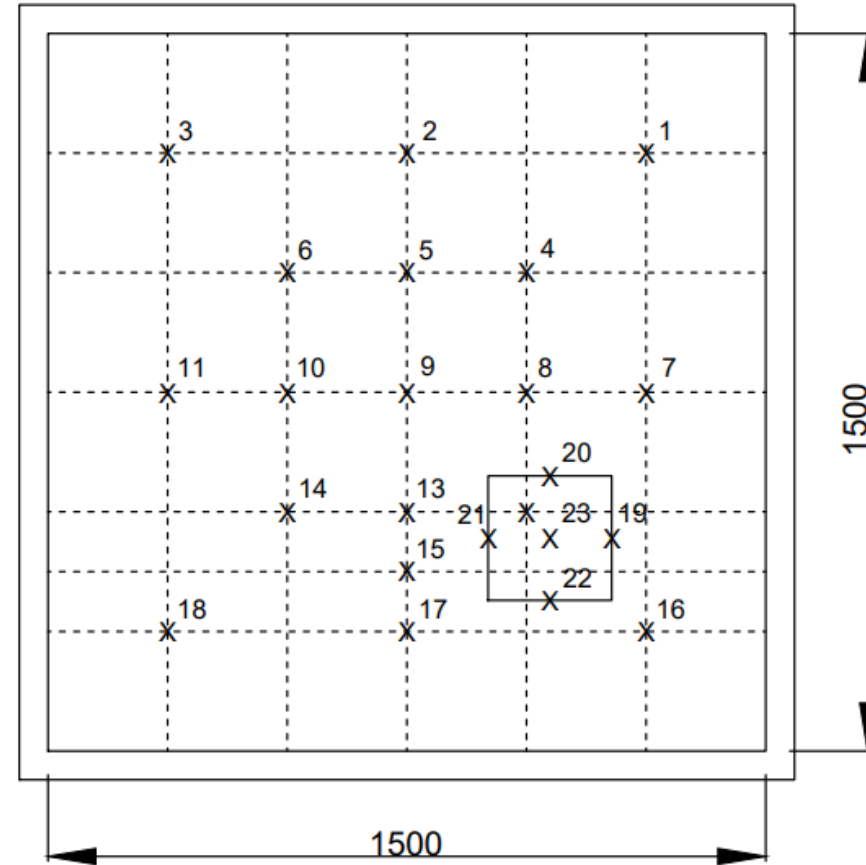
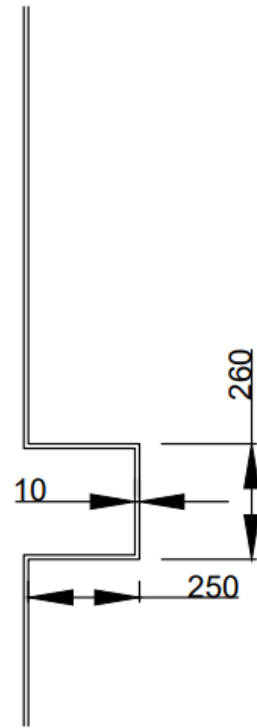
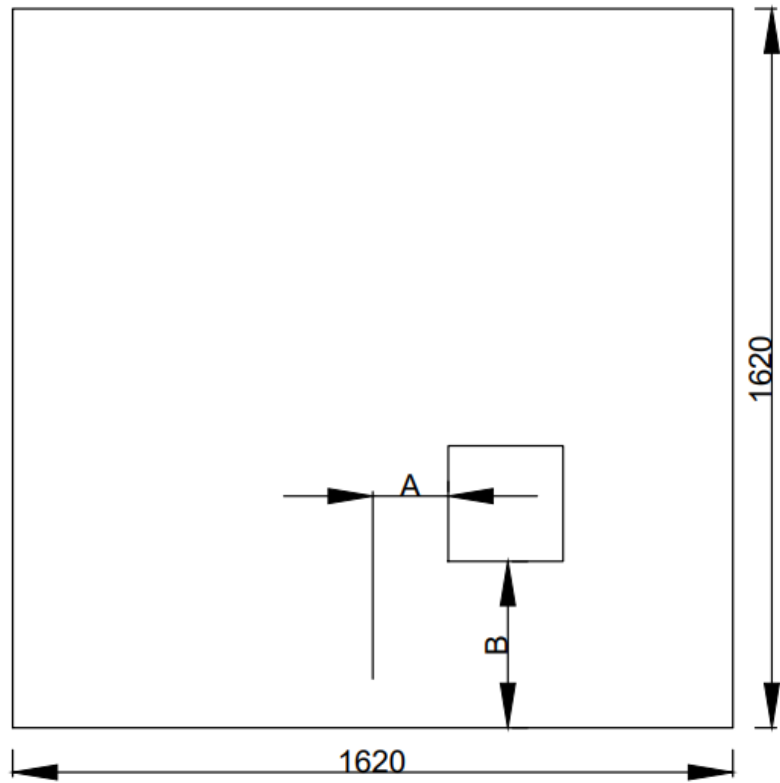
Testing & Assessment

- References UL1709 and ISO 22899
- Sets minimum test requirement
- Gives field of applicability of test results
 - Direct applicability
 - Permitted deviations and modifications from as-tested items
- Provides methodology for assessment
 - Section factor definition
 - Interpolation of data
 - Minimum requirements for modelling and software
 - Combination of JF and UL1709 data



Functional tests of complete assemblies provide the most reliable assessment of performance in fire because CPCE inevitably contains numerous components that will fail at a range of temperatures. In the absence of known failure criteria, or when item response is not predictable, then functional tests should be undertaken. In general terms, functional testing can be considered to be more robust than non-functional testing, and such results should take precedence over non-functional test results in situations of all other aspects of testing being equal.

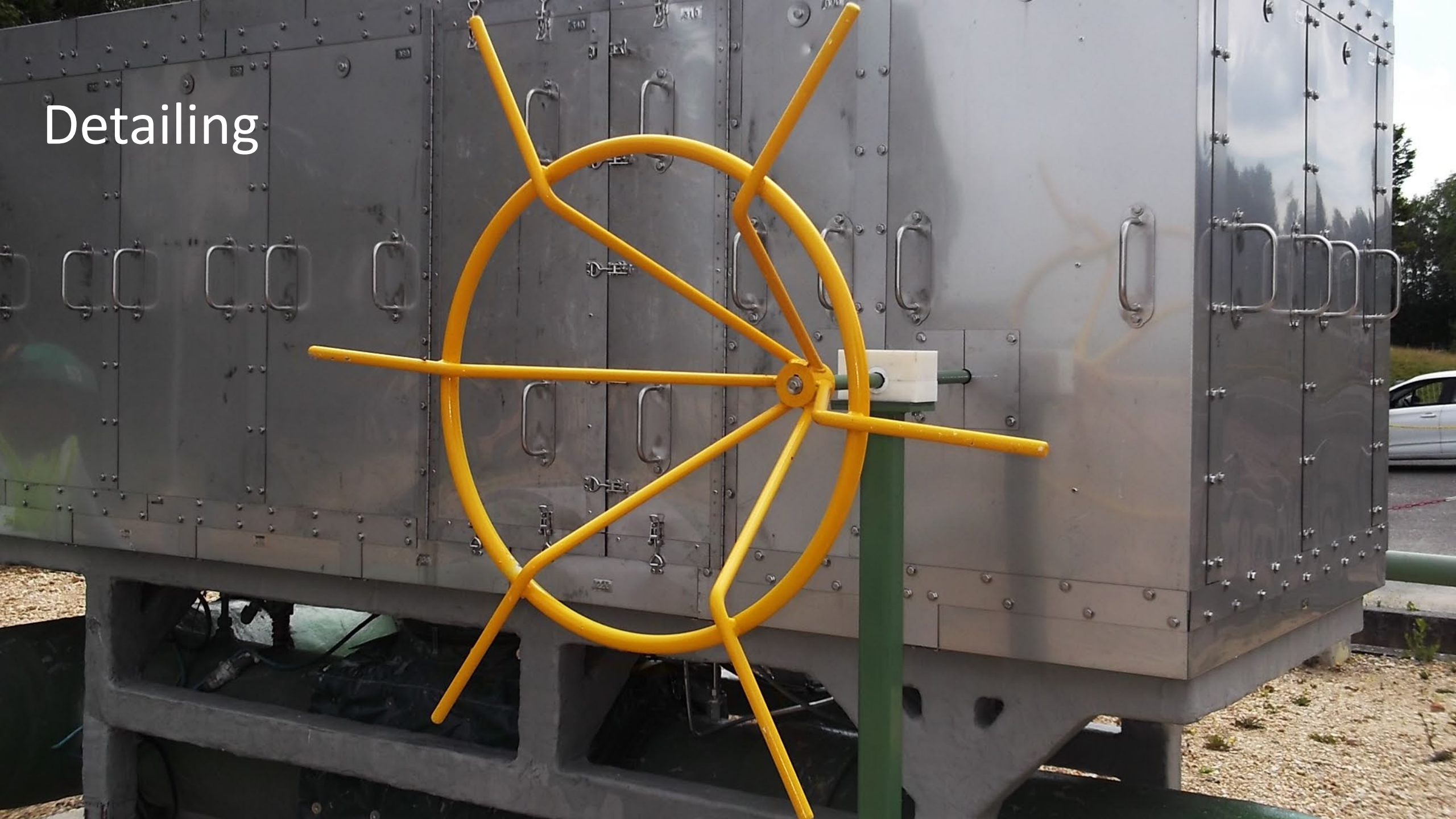
However, there are practical challenges in performing functional tests, and it is not realistic to expect all combinations of equipment and assemblies to be tested. Furthermore, functional test specimens are difficult to obtain and knowledge of the specific end-use of PFP is unlikely to be known at the time of initial type testing. Therefore non-functional tests are widely used in industry, and if the failure criteria of the CPCE item is characterised and understood, non-functional tests are also appropriate.



Certification

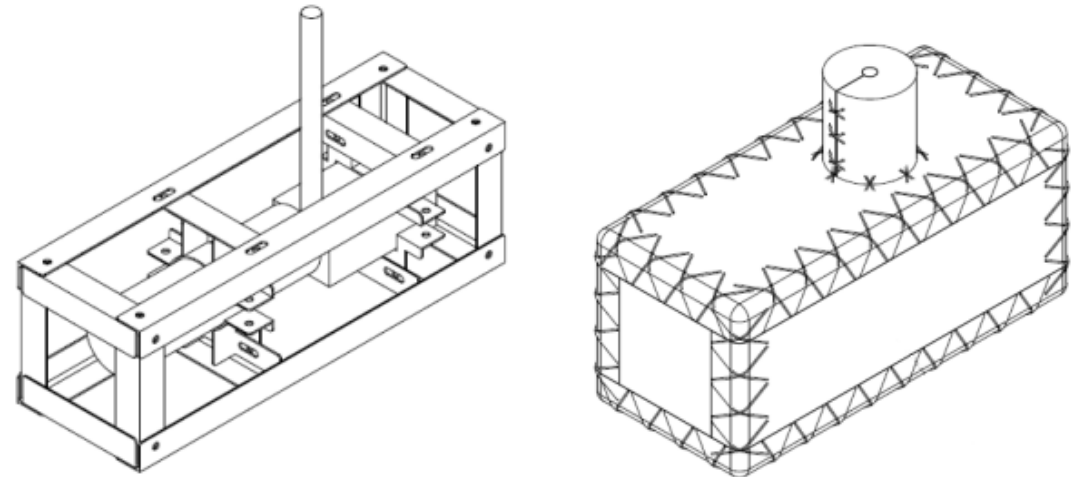
“...there is a huge difference between several 3rd party CA’s and I have always preferred Lloyds Register as their certification is very detailed and shows what was tested, what features are included and what limitations are to be considered.”

Detailing



Detailing

- Discusses the importance of:
 - Coatback/heat bridging
 - Corner detailing
 - Overlaps & joints
 - Terminations & interfaces
 - Cable transits & penetrations
 - Ventilation & drainage
 - Supports
 - Etc...
- Gives guidance on what evidence should be shown for the above



Summary

- Design Guide 1: PFP for CPCE is finalized
- It will be the first in a series of design guides, that will address detailed aspects related to the design and specification considerations, including testing and assessment, for categories of PFP products
- They are aimed at all levels of the contract chain and all parties in industry, but particularly:
 - owner/operators
 - assessment and verification bodies
 - test labs
 - manufacturers

Q&A

